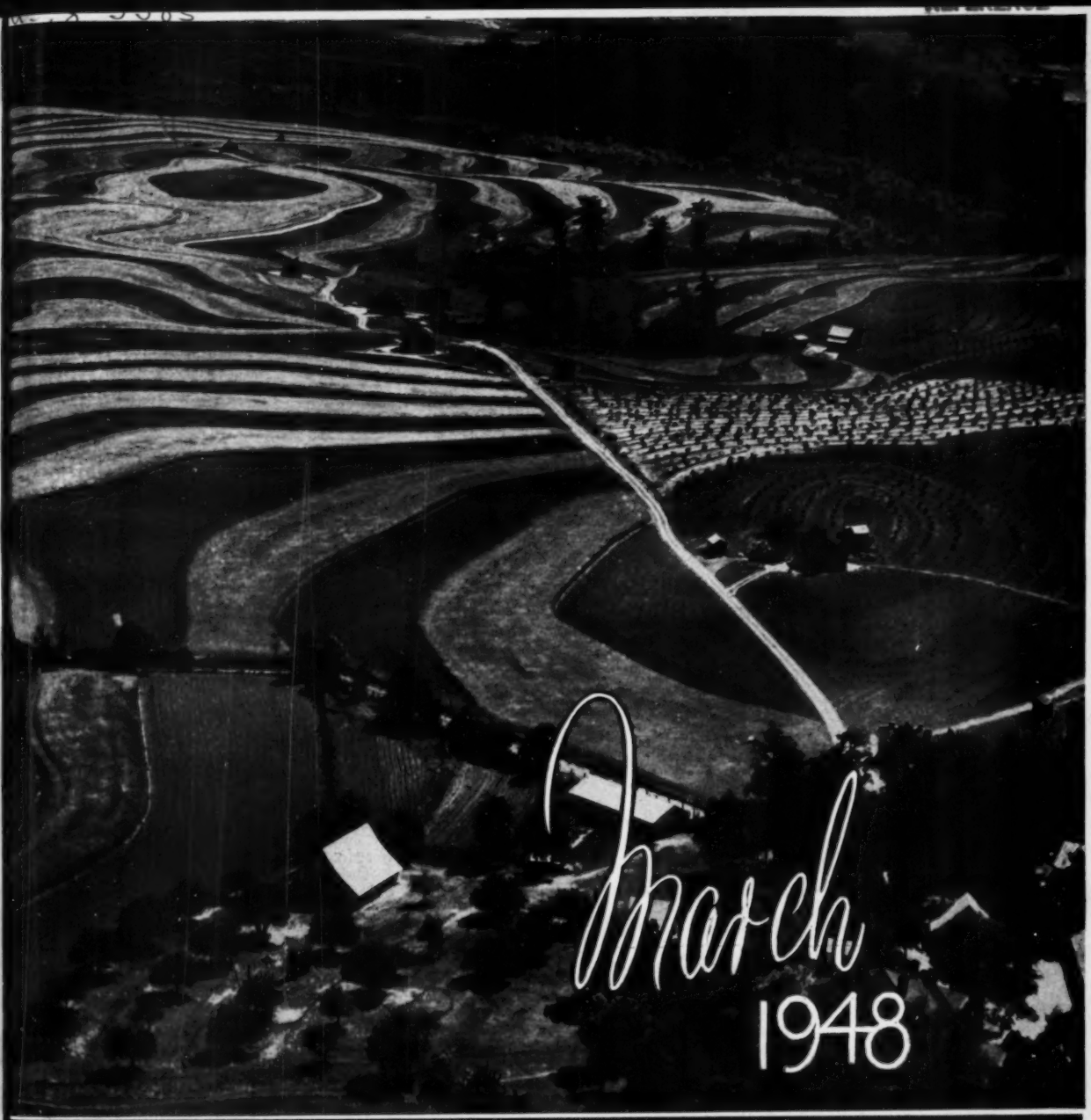


SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

SOIL CONSERVATION •

MARCH – 1948
VOL. XIII – NO. 8

CLINTON P. ANDERSON
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

In this Issue—

	Page
WHEN OUR "FRECKLED NOSE" GROWS UP By Paul T. Gilbert	171
SOIL, SOWERS AND THE CHURCH By Rev. Ray F. Magnuson	174
CROP RESIDUES SERVE TWO FARMERS WELL By C. Wallace Buck	177
OWNERS SEEK LIGHT ON LAND By Guy C. Fuller	179
TULIA OUTDOES ITSELF By Paul H. Walser	181
GRASSED WATERWAYS IN KANSAS AND NEBRASKA By Ira K. Landon	184
BREAKING NEW GROUND. A review by John Keller	190
GAINS POSTED IN SOUTHEASTERN STATES	191
NEWS FROM FARMS OF SOUTHWEST	192

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

10 CENTS PER COPY **$1 PER YEAR**
FOREIGN—$1.50 PER YEAR
25 percent discount on orders of 100 or more subscriptions mailed to a single address

WEEKLY REVIEW.—A unique service to the community is being performed by the Pilot Point National Bank, Pilot Point, Tex., through the use of purchased newspaper space for a weekly review of activities on nearby farms and ranches cooperating with the Denton-Wise Soil Conservation District. Publisher W. B. Crossley of the Pilot Point Post-Signal directs attention to a three-column display presentation of the week's conservation story supplied by the local work unit and sponsored by the bank. The summary appears under the heading "On Local Farms."

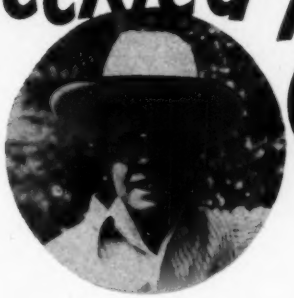
HE LEVELED.—Leveling of 5 acres of land on his 23-acre farm near Espanola, N. Mex., has reduced irrigating time by three-fourths, is giving 10 times better utilization of water, and promises to double the crop yield, according to W. H. Law, of the Pojoaque Soil Conservation District.

"Water penetration was so favorable that it took the field 5 days to get dry enough to plow when before leveling it required only 2 days to dry out," Law said. "Before leveling, the irrigation of this field was a real job. I had to dig, shovel, turn my water, and continue this all day long. Since Soil Conservation Service engineers gave me technical assistance irrigation is simple, and I plan to put all of my 23 acres in this condition."

FRONT COVER.—This view of the up-and-coming farm of J. W. Gaston, Spartanburg County, S. C., shows strip rotation of cotton and small grain. The small grain is followed by annual lespedeza. Width of strips: one terrace interval. Soil: Cecil. Photographer: Orin S. Welch.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

When our "Freckled Nose" Grows up



By PAUL T. GILBERT

IT WAS SPECK they called him, and rightly so, as his freckles gleamed abundantly through his tears while teacher disciplined him before the entire class. Speck was late again and his sins hung heavy upon him as he faced disgrace repeatedly in the little rural classroom. His embarrassment accented the fact that Speck was not a bad boy, but the adjectives pounded about him, "incorrigible, listless, lazy, uninterested, a dreamer." He knew the lines by heart and took the teacher's onslaught in apparent, silent indifference.

"Why was he late?" Gosh, he didn't know. Mother had got him off early enough. But there was no use tryin' to explain to the teacher or to mother that he just had to stop and watch the strange way that Mr. Jordan was ploughing his field, around the hills instead of over them the way Speck's dad had always done. Then, of course, he just had to stop to chase the big bobwhite and her little ones into the brush so that the angry, darting hawk up above wouldn't get 'em. Besides, some big fish was jumpin', in Mr. Jones' pond, and Speck just had to catch a grasshopper and see if the lunker would jump again.

Like all things good and bad, the discipline finally ended. Speck trudged disheartedly back to his seat, where he slipped off into immediate deep mental debate as to whether the long-legged bird on Mr. Jordan's marsh swallowed the green frogs head first or feet first.

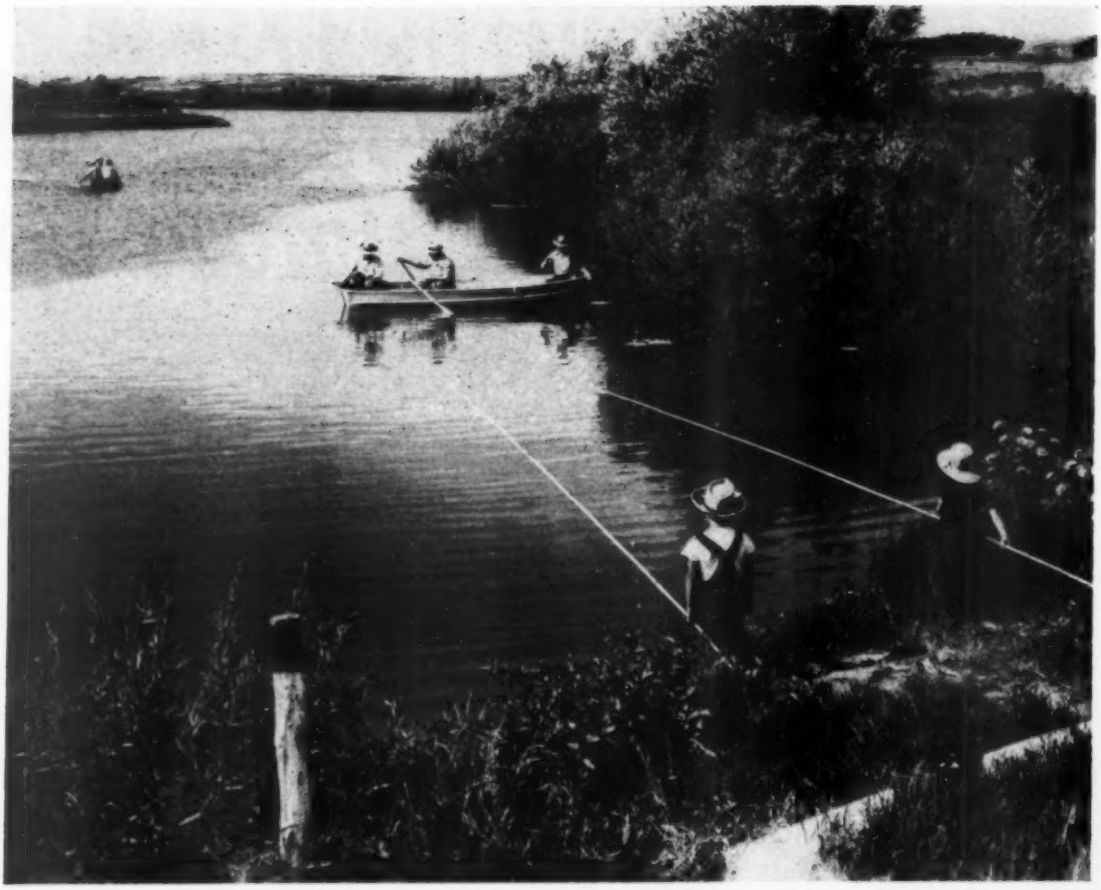
Speck was not too different from many lads his age, yet he was definitely a problem, not because of any malicious tendencies but because he just didn't seem to care. Speck did have his own interests, however. His interests were wrapped around all that lived in the out-of-doors in the neighborhood of his father's farm. He loved the feel and smell of fresh-ploughed soil; the cool rain as it ran down the yellow curls to his forehead. And how he loved to try to decipher nature's little mysteries he found before him!

However, teacher did not recognize or realize the many ways that she might capitalize on these interests, developing them finally into a stage where they would be directed into other related channels. For example, had the teacher capitalized upon Speck's interest in Mr. Jones' contour ploughing she could have gained Speck's interest and admiration by developing a small study project on such land use procedures, their benefits and possibilities, finally diverting this interest into how other countries cared for their land and, before Speck realized, he might actually enjoy his lessons in geography.

A similar attack through the channels of the wildlife on the farm, compared with that of other lands, might be in order. The biology of relationships could well be wrapped around Speck's knowledge, self developed, of the animals he had found as friends along Mr. Jordan's pond or on his father's farm, until Speck himself would be asking questions calling for additional knowledge in related fields in which he had thought there was little of interest.

But how was Speck to be expected to analyze his interests in such terms of related endeavors without guidance from the educated mind of his teacher? Or is it just possible, that the teacher's

NOTE.—The author is executive secretary, Nebraska Game, Forestation and Parks Commission, Lincoln, Nebr.



Grown-ups must capitalize on children's natural interests, "developing them finally to a stage where they would be directed into other related channels."

mind was not educated in the necessary categories to capitalize on Speck's interest in contouring, farm ponds and wildlife in general? Speck's teacher was undoubtedly one of those unfortunates who had been schooled profusely in how to teach, at the sacrifice of what to teach.

True, more progressive schools are teaching conservation in all of its related categories but chiefly in the specialized, advanced agricultural courses. This is most desirable. However, it will be the local school teacher, and not the specialists in various State and Federal agencies, who will finally accomplish the conservation sales campaign to the youth of America. This will not be accomplished until the pedagogues realize the fundamental need for teaching all Americans the value of saving our soil, water, and other natural resources, chiefly by doing something about it.

The placement of blame for this neglect has no place in a sound, constructive planning program. Certainly, remedial measures will arise only through the integration of ideas between competent educators in our various teacher-training institutions and other individuals specialized in the knowledge of sound conservation procedures pertinent to our natural resources.

Speck and his pals care little whose responsibility is foremost in such an endeavor. They only know that they love the out-of-doors and all connected with it. They would worship at the shrine of any who could answer the questions so vital to themselves; and who could capitalize on this interest any better than the classroom teacher?

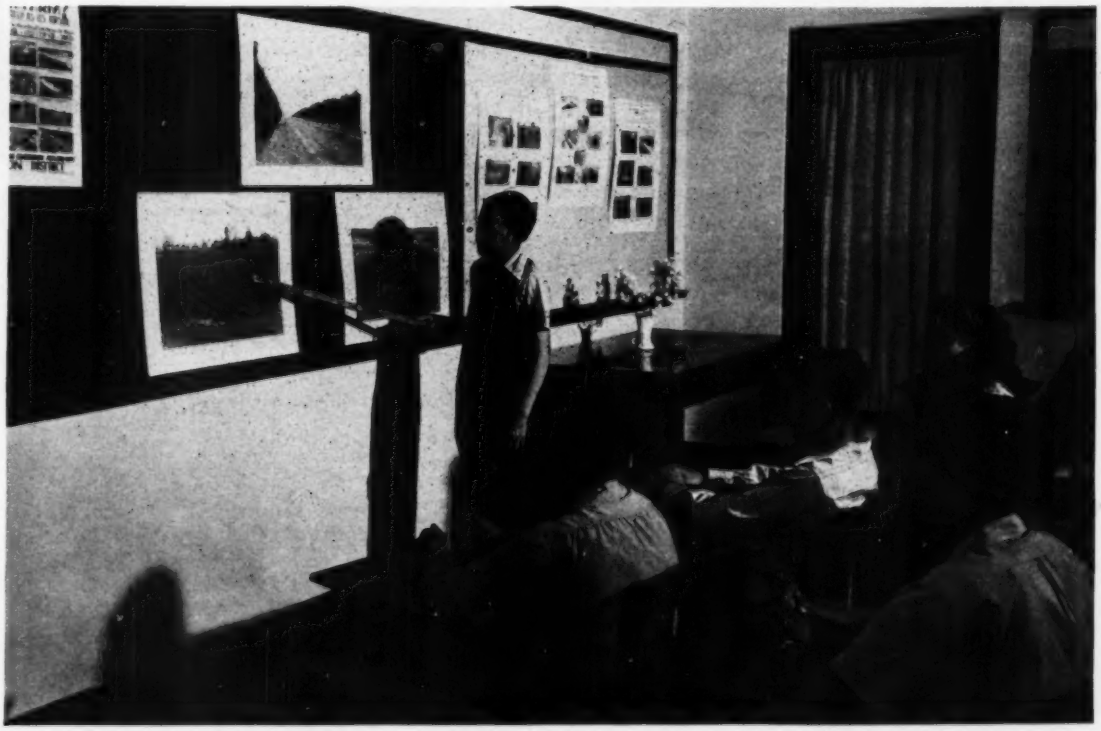
Assuming that a pedagogical Utopia may sometime exist with rural teachers familiar with the story behind grassed waterways, farm ponds, con-

tour farming, shelterbelts, wildlife habitat development and similar subjects, what will be the aids that will be available for demonstration work, and specialized assistance? The field of such material is unlimited and the cooperating agencies numerous. In fact, many such agencies are well in advance of the average teacher's capacity to use such materials, due to inadequate previous training in such categories.

In Nebraska, a coordinated program is being developed with definite success. Conservation camps, field demonstrations, and school programs built around rural interests are being developed through the cooperation of the Soil Conservation Service, the 4–H Clubs, the Future Farmers of America, the county agents and the Game, Forestation and Parks Commission. Such topics as "Farms for Keeps," "Good Farm Management is Good Game Management," "Developing Homes for Wildlife," and similar programs on soils, farm methods, fish, fur, game birds, and animals are frequently presented along with the learning of skills pertinent to hunting and fishing. These programs presented by specialists in these various fields are most successful. But they are the exception in any given area rather than the rule. due to the large State area to be covered. Their value would be substantially increased if they were the end product to a continued unit program in a rural school, rather than merely a one-shot inoculation. A poignant part related to this continued conservation school program is the fact that Speck, and others like him, can unquestionably sell the program faster to his farmer father than could any field man of any agency.

Adult conservation education is progressing with greater velocity than the youth program. However, many virgin fields still remain unstimulated. Sound conservation programs for adult participation are numerous but in no sense proportionate to the demands. The reason for this is apparent: Lack of funds and personnel in various related agencies, accentuated in some cases by complete absence of policy promulgating public relations.

(Continued on page 180)



Speck and his pals love the out-of-doors and all connected with it. They would worship at the shrine of any who could answer their questions. Who could capitalize on this interest any better than the classroom teacher?

SOIL, SOWERS *and the Church*

By REV. RAY F. MAGNUSON

"A good man leaveth an inheritance to his children's children" (Proverbs 13: 22).

THE CREATOR seems to be a very patient and long-suffering teacher. We are so slow to catch on. And in no area have we been slower to catch on than in this problem of the earth, its soil, and man's proper relation to it. As one sees the devastation caused by man's ignorance and folly in his wasteful misuse of soil and forest, he is reminded of the story which Brooks Hays from Arkansas tells. An old back-store philosopher was asked if he believed in the total depravity of man. "Believe it?" he asked, as with expert aim a squid of tobacco juice hit the nearby sawdust box, "Why, I have saw it!"

Whatever may be one's view of the theology of man's inherent condition, one dares to say with some assurance that in this problem of soil and its use, theology does enter. When General MacArthur, at the time of the surrender agreement with Japan, said that world peace and reconstruction was a theological matter, he was giving expression to a truth that has wide application. He might well have said that every human problem has a theological nexus.

However, there is theology *and theology*. There is nothing so bad as a bad theology. For example, it is strange indeed how a few verses in Genesis have been stretched into a theory that the earth and everything upon it bears the taint of a God-imposed curse. Granted that the theory does have an element of logic when applied to man, surely as we think of the earth and the plant and animal life upon it, we cannot share the pessimistic and darkened outlook of those, who, like the animistic nature worshippers of primitive tribes, find demon-like forces in control of nature. The intricate patterns of snowflakes; the tall symmetry of pine trees; the shades of color in rocks and flowers and rainbows; not to mention such modern miracles as radio and atomic energy and penicillin; all these earthly things suggest the deeper truth that the earth is full of the glory of God.

> "This is my Father's world,
> I rest me in the thought,
> Of rocks and trees, of skies and seas,
> His hand the wonders wrought."

We are either obstinate or woefully blind if we cannot sense this more basic theological assumption—the more Biblical one, if you please—that the earth is the Lord's. With much more evidence than can be mustered by the back-store sage, the man who walks with eyes of faith can say, "I have saw it." Whether he reads from the open pages of nature itself, or from the Book of the Ages, matters very little. The answer is the same. As one reads the Genesis story of the Creation, he comes to the end of that great drama where it reaches its sublime conclusion in the words, "And God looked upon the earth and saw

NOTE.—The author is secretary of town and country work, Nebraska Annual Conference of the Methodist Church, Nebraska Wesleyan University, Lincoln, Nebr.

that it was very good." The author of that great drama was not writing tragedy. The ending was a hallelujah chorus in which the stars sang together, and the trees on the hills clapped their hands for joy.

All of which provides support for the first proposition we would venture to set forth in this discussion of soul and sowers. *The soil is not evil;* it is sacred, for God made it. Liberty Hyde Bailey is theologically correct when he speaks of the holy earth. It is God's priceless gift to man, whom He has created to be a steward of its treasures, and to pass on its inherent richness to oncoming generations.

If we accept this basic proposition, it means that the problem of soil conservation is brought into a new orbit of consideration. For it is seen for what it really is—a moral and religious issue. Bluntly speaking, it means that he who misuses the earth or wastes its treasures is *guilty of sin.* He has sinned against God and against his fellowmen. He has betrayed his stewardship. He has broken the commandments, one of which states specifically that one shall not steal. They who destroy the fertility of the soil rob future generations of their rightful heritage.

There is a second proposition that offers the Church a strong apologetic for becoming directly involved in the soil conservation program. It is the theological principle that *whatever affects the welfare of people is always a major concern of a high religion.* There is a type of religion which construes salvation in very narrow terms. To adherents of this group, salvation is *salvage.* It is a religion of escape only. Like the fakirs of India, this group minimizes the efforts that are made to make this world more habitable for Christian living. But a high religion, while not for a moment relinquishing its interest and concern for the life that follows this earthly existence, is greatly concerned about life here and now. It construes

"If my land cry against me, or that the furrows likewise thereof complain; let thistle grow instead of wheat, and cockle instead of barley" (Job 31: 38, 40).

the Kingdom dream of Jesus to be an idea which must have its beginning in this life.

Even superficial study of the facts shows that soil has a most direct relationship to the welfare of people. For example, it affects their health. It was not until I began to read some of the current literature dealing with soil fertility and its relation to mineral and vitamin content of vegetables, that I realized that lettuce is not lettuce, nor are potatoes merely potatoes. Bad teeth and various diseases caused in part by malnutrition can be traced to poor soil. Of course, poor soil means poor crops, which means low income, which means insufficient money to have adequate medical care, which means, again, bad health. Directly and indirectly, soil makes the difference between good health and bad health. It is a poor kind of religion which will not take cognizance of this state of affairs and in the name of a good and loving Father, attempt to do something about it.

The ramifications of what poor soil can do to people are so many that it would be utterly impossible within the compass of this article to explore them. Sufficient to say, the Church, in the name of the God it proclaims and the principles it espouses, cannot do other than lend its influence to the best solution of the problem. But there is a third reason why the Church is concerned. *Unless the soil is saved, the Church itself as an institution is threatened, particularly in rural communities.* Dr. T. S. Buie, regional conservator, Soil Conservation Service, Spartansburg, S. C., has made some very interesting studies of the relationship of soil to churches. His conclusions are what might be expected; namely, that in areas of high soil fertility, the rural churches are in a flourishing condition both in terms of attendance and in finances as compared with rural churches in areas that have been greatly eroded. Comparing church with church, the ratio in favor of the former is at least two and one-half to one. And this does not tell the whole story. In one instance, there is hope for the future, in the other instance the Church is a dying institution.

The question, perhaps the $64 question, is "will the Church, with its potential power for influencing people, mobilize its strength sufficiently and in time to aid materially in this Nation-wide struggle to save its basic resource?" Frankly, we are not sure. Up to the present moment, the Church has been pretty much asleep so far as any serious attempt is made to provide sufficient motivation and organization for the task. But there are encouraging signs that an awakening is at hand. More and more, the major denominations are giving encouragement to rural pastors and laymen by calling conferences dealing with this and kindred topics on rural life in the hope that these leaders will not only be able to provide religious motivations for this crusade through sermons and teaching, but will in many instances directly relate themselves to programs on soil conservation by serving on committees and by making their churches the headquarters for community meetings dealing with the subject.

Obviously, the technical leadership of the soil conservation movement will and should remain in the hands of skilled conservationists. Most pastors have neither the time nor the training to become experts in this field. But this should not inhibit them from seeding as much direct association with the movement as their schedule will permit. Moreover, there is no reason why the average pastor could not familiarize himself with most of the technical phases of the problem. By so doing, he will be in a much better position to understand the moral and spiritual aspects involved.

This article, of course, is written from the standpoint of one who has recently completed 18 years in three rural pastorates. It is to be expected that what is here written will reflect something of a bias that years of ministerial activity have a way of bringing about. It would therefore be presumptuous to suggest to Soil Conservation Service people, boards of supervisors of soil conservation districts and others, how to accomplish their tasks. And yet, we who are in the Church as pastors (and sometimes as laymen) with some temerity would say that one reason why more of us are not in this great struggle to save America's soil is *because we have not been asked to help.* At least the recruitment has not been too persistently carried on.

We country preachers, being human, are quite susceptible to intelligent and friendly persuasion. Most of us are in the crusading business by choice. And if conservationists would help us to see our tasks in relation to this great problem and would appeal to us, not from the standpoint of that which is merely mercenary but from larger, unselfish considerations, they might be surprised at our eagerness to respond. Not all of us, of course. But hundreds of us would. Most preachers are gun-shy of programs that are saturated in a cer-

(*Continued on page 180*)

CROP RESIDUES SERVE TWO FARMERS WELL

By C. WALLACE BUCK

EXPERIMENTS have been conducted at various experiment stations over the country on the value of crop residues for protecting land from both wind and water erosion.

I want to tell you in this article about the experiences of two farmers in northeastern Nebraska in the preparation of seed beds, the planting of crops, and the cultivation of row crops on land protected by a cover of crop residue.

Northeastern Nebraska is in the loess hill region. The topography runs from gently to steeply rolling. Predominant slopes are from 8 to 15 percent. Soils vary from silt loams to silty clay loams. The average annual precipitation is from 25 to 30 inches, with occasional rains of high intensity.

Grain crops in this area are chiefly corn, oats, barley, and wheat. Soil building and hay crops are alfalfa, red clover, sweet clover, and brome grass, either singly or in mixtures.

Interest in the use of crop residues to control water erosion started in northeastern Nebraska upon publication of the results of research conducted by Dr. F. L. Duley, of the Soil Conservation Service, and J. C. Russell, cooperative agent, University of Nebraska.

The adaptation of this research to practical use has produced a number of problems especially in connection with the securing of suitable equipment to till the soil and leave crop residue on the surface. However, some farmers have developed ways of doing a commendable job with only a minimum amount of specialized farming equipment.

Albert Watson, a farmer living 3 miles north of Wayne, Nebr., is completing his fourth year of cultivating his 240-acre hilly farm under a protective cover of crop residue. His crop rotation consists of corn, oats with red clover, corn; one field of red clover is left standing over each year for hay and seed. Red clover is planted with all spring small grain. The small grain is combined, leaving the straw scattered over the field. The following spring, after the red clover has grown to a height of 6 to 8 inches, the land is subsurface tilled with a 7-foot tool-bar machine having three 30-inch sweeps. The first tillage operation is made shallow, from 2½ to 3 inches in depth, to cut the clover roots. A disk or rotary hoe run backwards is then used to tear out the clover and stop its growth. The land is subtilled again before planting at a depth of 4 to 6 inches. Planting is done with a hard ground 2-row lister at a depth of 3 to 4 inches and the land harrowed immediately. This harrowing operation pulls the residue back to the surface and stabilizes the contour ridges. The land is harrowed once more after the corn appears, and then cultivated two or three times with a regular tractor cultivator equipped with sweeps rather than the conventional shovels. Watson tried using a planter with a stub-runner and furrow-opener, like the type used in the experimental work at Lincoln, but prefers using the lister as he thinks it is easier to control weeds by this method. An observation of his corn fields indicates that he has controlled weeds and maintained a protective residue cover throughout the growing season.

Second-year red clover land is always planted to corn and is handled the same as stubble land, with the exception that only one subsurface tillage operation is necessary.

Land for small grain is prepared by disking the cornstalks and drilling in the oats and red clover.

In 1946 Watson prepared a 12-year-old alfalfa field for corn by subsurface tilling and double disking, then following the same method of planting and cultivation as on his stubble land. This field of corn yielded 52 bushels to the acre in a dry season while plowed alfalfa land in the same community yielded 10 to 15 bushels per acre.

All tillage operations on the Watson farm are performed on the contour. In addition, the land is protected by double spaced drainage type terraces with an adequate water disposal system. Before embarking on a stubble mulch tillage program, there was considerable interterrace erosion and silting in the terrace channels. Now there is very little noticeable erosion and the terrace chan-

NOTE.—The author is district conservationist, Soil Conservation Service, Wayne, Nebr.

772975—48——2

nels are practically silt free. Watson considers his terraces as safety valves in the advent of severe rain storms.

Watson finds that soil protected by residue cover never bakes or gets hard following rains and that it stays moist much longer than unprotected soil. The only use being made of the moldboard plow is in the plowing of brome grass used in rotations. Some experimenting has been done in handling grass without plowing, but as yet, no successful method has been found.

Crop yields on the Watson farm have been well above county averages. There is not much difference under favorable moisture conditions, but during dry seasons the advantage of stubble-mulch tillage over the commonly practiced clean-tillage method is outstanding.

Albert Sibbernsen owns and operates 800 acres of steeply rolling land 15 miles northwest of Omaha, Nebr. He became interested in the use of crop residues as an erosion control measure in 1939 and purchased one of the first subsurface tillage machines in this area. Since then, every effort has been made to keep as much residue as possible on the surface of the land.

Crop rotations followed on the Sibbernsen farm are as follows: (1) 2 years of corn, oats with sweetclover, sweetclover, wheat; (2) 2 years corn, oats with red or sweetclover and back to corn. From 125 to 150 acres of cropland is kept in alfalfa. This alfalfa is allowed to stand for 3 to 4 years before breaking out and planting to corn.

In preparing land for corn following small grain, Sibbernsen subtills the stubble in the fall, using a tool-bar machine with three 30-inch sweeps at a depth of 3 to 4 inches. The land is subsurface tilled again in the spring at a depth of 4 to 5 inches. The corn is then planted with a two-row surface planter equipped with stub-runners and furrow-openers. A rotary hoe is used for the first two cultivations, followed by one cultivation with a regular tractor cultivator equipped with sweeps instead of the conventional shovels.

When corn follows corn, Sibbersen first uses a stalk cutter to cut the stalks from the previous crop. This, he says, must be done when the stalks are dry. He follows this operation with the rotary hoe to break the stalks further and distribute the fragments more evenly. He then subtills the land and planting and cultivation are the same as described for corn following small grain.

Stubble land to be planted to wheat in the fall is subsurface tilled at a depth of 3 to 4 inches just as soon as the grain is harvested. It is subsurface tilled again just before planting and the wheat sown with a regular grain drill.

Second year sweetclover is usually followed by wheat. The clover is mowed in June. After the clover dries, a one-way disk is used, running the disk shallow to cut up the clover and partly cover the residues and start its decomposition. This field is subsurface tilled before wheat planting and the wheat sown with a grain drill.

Sibbernsen plows all the alfalfa land on his farm before returning to grain crops.

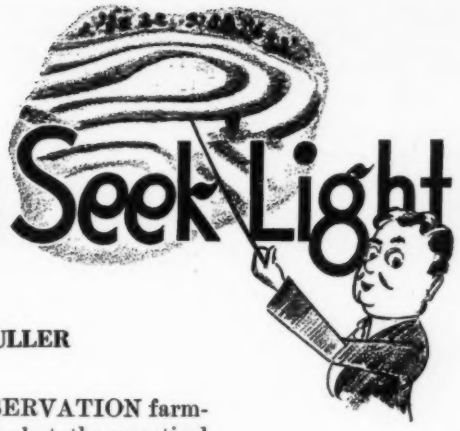
On the Sibbernsen farm, as on the Watson farm, all tillage operations are performed on the contour and the land terraced with grassed waterways. Originally Sibbernsen tried to cope with the erosion problem without terraces. The crop residues on the land protected it against ordinary rains, but heavy downpours caused gully erosion. This convinced him that terraces were needed. One field on which terraces were constructed in 1935 required maintenance for the first time in 1947. They had been protected continually by residue cover.

To show the effectiveness of residue cover in preventing run-off, Sibbernsen shows visitors a valley entered by two drainageways serving land areas of equal size, one from his land and one from a neighbor's where the watershed is unprotected. The heavy spring rains this past season failed to reach the floor of a light plank bridge over the drainageway from Sibbernsen's land while a like bridge over the drainageway from the neighboring land flooded over on several occasions.

Like Watson, Sibbernsen has noticed little advantage to crop yields under favorable moisture conditions, but there is a marked difference in favor of stubble-mulch tillage during dry seasons. Both men claim that preparing the land for planting by use of the subsurface tillage machine is cheaper than using the moldboard plow. They both point out that their land is gradually increasing in fertility by the constant accumulation and maintenance of organic matter in the soil.

A number of farmers in northeastern Nebraska are using methods similar to those followed by Watson and Sibbernsen, or variations of these methods, with satisfactory results. They realize that if soil fertility is to be maintained in this steeply rolling section run-off must be controlled.

Owners Seek Light on Land



By GUY C. FULLER

THE SCIENCE OF CONSERVATION farming is rapidly developing, but the practical application on the land is only beginning. The greatest obstacle to getting conservation on the land is still the lack of knowledge regarding the basic fundamentals on the part of land owners and operators.

The results of a recent experience is sufficiently encouraging to substantiate this conclusion.

The Stronghurst Booster Club, a wide-awake organization, in the village of Stronghurst, Ill., conceived the idea of scheduling a series of four meetings for the purpose of acquainting local people, especially city and village land owners, with the organization and operation of the local soil conservation district. They did not want a series of general meetings but something regarding the facts of the program.

A committee was appointed to work out the details. Soil Conservation Service technicians were requested to present the facts and lead the discussion. The dates and place for the meetings was arranged, as well as publicity procedures. A social period at the close of each meeting was announced, at which time coffee and doughnuts were served.

While the committee was completing arrangements for the meetings, the district technicians developed an interesting and informative program. To accomplish this job visual aid material was assembled, such as slides, movies, and chart material of factual data. This material was arranged in sequential order, with each phase adding to the framework of developing a farm conservation plan for a representative farm in the district.

NOTE.—The author is district conservationist, Soil Conservation Service, Galesburg, Ill.

Subject matter presented and discussed was, in general, as follows:

First meeting.—Preliminary remarks consisted of a brief statement regarding the purpose of the meetings, how the district came into being, how the district operates, introduction of directors, their duties and responsibilities, statement of policies, illustrations of local erosion conditions, a few conservation practices already adopted, the explanation of what a farm conservation plan contains and how it may be obtained.

Second meeting.—The development, interpretation, value and use to be made of a farm conservation survey map were examined.

Third meeting.—With the use of visual aids and charts, the place of each conservation practice was pointed out, as well as the comparative effectiveness of each, together with its application and maintenance. A comparison of crop rotation with yield data, fertility value, etc., was of special interest. Seeding mixtures for various purposes were emphasized.

Fourth meeting.—Because of the limited time perminent points and facts from the following subjects were discussed: A soil management program, pasture improvement, woodland, wildlife, and engineering. This fourth and last meeting ended with a summary of the essential steps and subject matter to consider in the development of a farm conservation plan based upon the capabilities of the land. The usual social period was furthered with hot coffee and doughnuts. The enthusiasm from these meetings soon spread to adjoining districts.

In the Warren County district, Monmouth, Ill., details were handled by a committee composed of a representative from the Monmouth Association of Commerce, Kiwanis, Lions, Rotary, and the local district board of directors.

In the Knox County district, Galesburg, Ill., the committe represented the senior chamber of commerce, junior chamber, cosmopolitan, Kiwanis, Rotary, Lions, Exchange, and the local district board.

The total value and accomplishments of these meetings in each district may be difficult to appraise but the following facts indicated to the sponsors that they were very much worthwhile.

1. The total attendance at each meeting increased, ranging from 75 to more than 200.
2. Applications for technical assistance in developing farm conservation plans increased in each district.
3. A higher percent of the applicants understand what they were making application for; their responsibility, as well as that of the district.
4. Revision of old conservation plans for more effective erosin control and improvement of soil management practices have resulted.
5. A better relationship between land owner and tenant has been brought about in many instances.
6. The fear of obligation and costs involved no longer exists on the part of many land owners and operators.
7. Needed conservation practices are more readily accepted by those who attended the meetings.
8. Better attendance at group planning meetings has been noted.
9. The committees have expressed a desire to sponsor a similar program in 1948.

From the standpoint of a worthy agriculture project for community improvement to be sponsored by any single or group of organizations, this type of program has many advantages, some of which are:

1. It is a program that requires very little cash.
2. It is a program that does not run for a long period of time (4 weeks in this instance).
3. It is a program of vital concern to everyone.
4. It is a program that has economic value to the individual and to the community.
5. It is a program that affords an opportunity for clarification and understanding regarding the responsibilities placed in the hands of the local people concerning soil and water conservation.
6. It is a program that makes available factual data of a technical nature, some of which is applicable in every community and on every farm.

Should any one question the statement that "The greatest obstacle in getting conservation on the land is the lack of knowledge regarding the basic fundamentals of conservation farming on the part of land owners and operators," needs only to experience the results of similar meetings.

"FRECKLED NOSE" GROWS UP

(Continued from page 173)

It is only with the unbiased unity and cooperation of all governmental and State conservation and education agencies and institutions, when completely familiar with each other's categories and related problems and possibilities, that the average farmer may become acquainted with the unified picture of sound conservation activity. More important yet, Speck and his pals may become so endowed while still attending the little country school that they will not have to wait until they reach adulthood to assimilate such conservation procedures as did their fathers. Instead, they will be so fully equipped by graduation time that such conservation procedures will be mere routine in their work of making America more productive, as well as a better place in which they can raise their offspring. A place with less problems and more interests for freckled noses such as Speck.

SOIL AND CHURCH

(Continued from page 176)

tain type of sectarianism. We just don't think that way. But appeal to us in the name of a high religion—and really mean it—and the results are apt to be surprisingly favorable. We are not willing to grind axes indiscriminately. But we are willing to grind the axe that is to be used for advancing the Lord's work. In fact, we will help swing it.

To the technician in the conservation crusade we would say that the country parsonage or manse may frequently house an ally who, with some acquaintance with the problem of soil conservation, could help turn the tide in many a community. And the Church he serves could well become an agency where powerful spiritual forces might be released actually to bring about a revival of stewardship, of which soil conservation is only one phase.

(Continued on page 190)

The Tulia staff: Miss Pat Brown, E. J. Myers, John R. Crocker, Chalmers Terry, Jesse Jenkins, and Edward J. Overby (presenting the award).

TULIA OUTDOES ITSELF—FOLLOWS ONE GREAT RECORD WITH AN EVEN BETTER ONE

By PAUL H. WALSER

THE TULIA, TEX., WORK UNIT of the Soil Conservation Service, recent recipient of a USDA Superior Service Award is not content to rest on its laurels. Its 1947 record for getting conservation work done on the land is even better than its award-winning 1946 performance. Ranchmen and farmers of the Swisher County Soil Conservation District, where the Tulia office is located, are reporting sizable increases in irrigation systems, terraces, management of crop residues, cover and soil improving crops and diversion terraces.

The Superior Service Award presentation ceremony was held in the Griffith Theater at Tulia. W. Scott Amend, district conservationist, told the 200 assembled farmers and agricultural leaders how the Tulia staff was able to win its high honor. He gave large credit to the district supervisors, Charles Herring, Victor Harman, Roy B. Bell, John R. White, and Norman Burke. "Those supervisors demonstrated their leadership by assuming the responsibility of administering the State Soil conservation law and by executing a district plan of operations," Amend said. He commended the supervisors for prompt action in the face of

NOTE.—The author is State conservationist, Soil Conservation Service, Temple, Tex.

J. T. Barnett, farmer, makes a good rodman. John R. Crocker runs the level. The picture was made as dusk came on.

emergency and cited particularly their quick appeal to local farmers to begin emergency tillage during a severe dust storm which struck early in 1947.

He also pointed to supervisor contacts with farmers and businessmen, the weekly news column carried by the Tulia Herald, the holding of an annual field tour, the promotion of conservation exhibits in local stores through the cooperation of the vocational agriculture teacher at Tulia High School, and the harvesting of native grass seeds for use in regrassing depleted range land.

He said that direct aid which farmers provided the Tulia staff in 1946 helped a lot. On numerous occasions local farmers took Soil Conservation Service technicians to the field in private cars when all staff automobiles were tied up. Farmers acted as rodmen, allowing the Service staff to split its crews and cover more ground.

The organization within the unit at Tulia itself contributed a great deal, according to Amend. "Weekly schedules were kept current. This enabled each employe to know his assignment at least 1 day in advance and to execute the assignment with little confusion or loss of time," said Amend.

He pointed out that personnel of the Soil Conservation Service staff were thoroughly trained, that high morale was maintained, that each member of the unit understood the plan of operations which the Swisher district uses, that they were able to work with whole groups of farmers in many instances, and that they were able to do a sound job of explaining to interested farmers ways of applying conservation measures.

Herring, farmer and district supervisor, told guests at the presentation ceremony of some of the work which the Tulia staff has done. He traced development of the Swisher district from a 1939 land use planning committee to its present day set-up and said the district is bringing additional income to the neighborhood from the better crops resulting from improved soil and moisture conditions.

"The goal of the district," he said, "is a complete soil conservation program on every farm." Herring said that the district now has 690 cooperating farms and 313,000 acres conservation-

Farmers helped by providing transportation when needed. Jesse Jenkins is nearest the camera. A. J. McCollum, farmer, is at the wheel of his car.

planned. The latter figure represents about 55 percent of all land in the district.

Exploring facts which have helped the Tulia work unit compile its outstanding record, he listed the low average age of local farmers, the high proportion of land owned by operators, the long-time tenancy agreements, and the high educational level. He added to that a number of items such as awareness that land in the district still is new and fertile, understanding that soil conservation measures are necessary to prevent return of dust storms, and cooperation of various local and outside agencies.

Pointing out each member of the work unit staff, Herring mentioned that Jesse Jenkins, conservationist, sold three farmers on using vetch and Austrian winter peas, a legume crop, several years back. "This year there are more than 7,000 acres of legumes in the district. The work unit is responsible," stated Herring. "Legumes pay their way with winter grazing and then they help suc-

ceeding crops. They seem to be part of the answer to our fertility problems."

Herring in turn singled out Chalmers Terry, engineer; E. J. Myers and John R. Crocker, aides, and Miss Pat Brown, clerk. "This section has gone in for irrigation on a large scale only the past half dozen years," he said. "Irrigation has brought erosion problems, because irrigation ditches wash when they are laid out wrong. Irrigation has made us concern ourselves with water-spreading. As late as 1940 it wasn't uncommon for two men to spend a whole day spreading water from just one well. Now I know a man—I know several such men—who farm as much as 240 irrigated acres without help. Improved methods of water application is the reason they can do it.

"We used to see a lot of stair-stepped fields here that were irrigated." Now Terry's pioneering has brought longer irrigation runs, uniform application. Instead of sitting around half a day at a time chinning about how to iron out kinks in irrigation systems, farmers here solve it easily. They say, "Go get Terry."

Herring said improved irrigation has saved pumping costs, increased crop yields and reduced erosion.

He termed Myers and Crocker the "work-horses" of the Tulia staff; Miss Brown the "brains." Stated Herring, "Our board of supervisors is very pleased with the help from the Soil Conservation Service personnel.

E. J. Overby of Washington, assistant to the Secretary of Agriculture, presented the Superior Service Award to the work unit. He pointed out that the Tulia staff was the only Service office in the Nation to get the honor.

Stated Overby, "You members of this Tulia work unit can well afford to feel a deep and lasting pride in this mark of your achievement. You members of the board of supervisors of the Swisher County soil conservation district, and all of you farmers who are partners in this enterprise, share in this pride.

Attending an appreciation dinner. Perry Bowser, farmer; R. M. Ross, assistant chief of operations, Soil Conservation Service; Edward J. Overby, assistant to the Secretary of Agriculture; Louis P. Merrill, regional conservator, Soil Conservation Service.

"That is because no such achievement would be possible unless you provided the opportunity for it. The real significance of the award lies in the extent to which it represents acceptable service performed for you.

"Viewed at long range, your part in the expansion of the soil conservation program here in the Tulia work unit is an important contribution to the national and world-wide agricultural program."

He handed the bronze medal and an embossed certificate to Jenkins. On the platform were other members of the staff.

R. M. Ross, of Washington, D. C., assistant chief of operations for the Service, told the Tulia staff farmers and ranchers, "You have set an example that will be a challenge to every other Soil Conservation Service work unit in the United States.

"The presentation of this award is symbolic of the rewarding nature of soil conservation wherever it is practiced. The rewards from conservation and wise use of the land are by no means limited to the farms and ranches on which you have assisted with the establishment of conservation programs. They extend to our whole society. Everybody profits."

Louis P. Merrill, of Fort Worth, regional conservator, stated that the soil conservation district furnishes a common denominator for neighborhood cooperation. "The soil conservation district

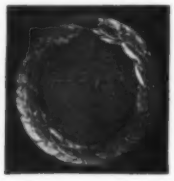
Sid Payne tells 'em what conservation has accomplished in Texas.

is established to enable the people to do those soil conservation jobs which need doing that the people can do for themselves," said Merrill. He said that the Soil Conservation Service is set up to do necessary soil conservation tasks which local people cannot do for themselves.

Sid Payne, a farmer, commended the work unit and the district on behalf of the Texas State Soil Conservation Board, of which he is a member.

Herring, Perry Bowser, a farmer near Tulia, and Ewell Griggs, president of the First National Bank, spoke briefly at a dinner preceding the award presentation.

Griggs, speaking on behalf of local businessmen, said, "You don't have to be half smart to know that when the farmer is helped we're all helped. We are for you because we're selfish enough to know that we're getting part of the benefits."



GRASSED WATERWAYS IN KANSAS AND NEBRASKA

By IRA K. LANDON

IN EASTERN NEBRASKA and northeastern Kansas, the annual rainfall varies from 25 to 35 inches. Storms of an intensity of 2 inches or more in 1 hour occur frequently. The dominant slopes are 5 to 10 percent, although some are much steeper. Most of the soils have deep profiles. They are dominantly loessial, but some are of glacial or residual origin. The loess soils are friable and fairly fertile. Due to the intensity of rainfall and to the slopes, gullying is common in the natural water courses. The establishment of grassed waterways under these conditions is more than just an agronomic project. It involves many other sciences.

NOTE.—The author is zone conservationist, Soil Conservation Service, Lincoln, Nebr.

The function of a waterway is to remove excess water safely. This water may be local rainfall, terrace discharge, or foreign drainage. If the waterway is properly designed, established and maintained, the damage done by the run-off will be held to the minimum. Protection from erosion is, or should be, the primary consideration, but some return may be obtained from hay, seed, or pasture. Before undertaking the establishment of a waterway, certain facts should be ascertained. What is the acreage of the watershed? What is the slope, the soil texture, the land use, the probable rainfall intensity? These data are needed to calculate the maximum rate of discharge or, in short, to figure the size of the job the waterway has to do. A waterway should be selected or designed to carry the peak flow of water for a given watershed at a safe velocity.

Strip cropping of corn with small grain in the uneven-width strips, Washington County, Nebr. Two seeded, natural drains are to be seen here.

The velocity of water flowing in open channels is determined by:

1. The slope of the channel.
2. The depth of the water.
3. The friction between the water and the channel lining.

The friction between the water and the grass varies with the height and stiffness of the grass and the density of the stand. We always strive for a dense stand of adapted grasses but, because of the seasonal variations, we may have less than this ideal situation.

Occasionally it is possible to choose between two or more sites for a waterway. This is the exception, however. Usually the slope or grade of the waterway is determined by the topography of the only available site. The slope factor can seldom be altered except for the smoothing of overfalls and other minor irregularities.

This leaves only the variation of the depth of water as a means of controlling velocity. Fortunately, this is the easiest and the cheapest of the three factors to manipulate in waterway construction. Decreasing the depth of flow to reduce velocity can be accomplished only by widening the channel.

Let us assume a watershed with a maximum run-off of 60 cubic feet per second. Suppose that we have a choice of two sites for the waterway. One has a slope of 10 percent and the other 7 percent.

The tables and graphs in our Engineering Handbook show that on a 10 percent slope a sod channel with 8:1 side slopes, a 21-foot bottom width and a 5-inch depth of flow would be required to carry 60 cubic feet per second at a velocity of 6 second feet. On a 7 percent slope, a channel of 11-foot bottom width with 8-inch depth of flow will discharge the same quantity of water at the same velocity. Other things being equal,

Seeded bluegrass outlet channel protected from livestock by fencing, Johnson County, Nebr. Sodded in the spring of 1937 it quickly firmed up, ready to carry water without eroding. Seed had been stripped before photo was made.

the 7 percent slope should be selected. However, sometimes other things are not equal. A hazardous discharge point or a sand pocket in the 7 percent side would make it advisable to choose the steeper slope. If so, it must be remembered that, although an 11-foot bottom width with 8-inch depth is adequate on a 7 percent slope, these same specifications are not adequate on a 10 percent slope because the steeper grade and greater depth of water would increase the velocity from 6 second-feet to more than 7 second-feet. Excessive velocity such as this may be, and frequently is, the cause of failure of vegetated waterways.

Six feet per second has been observed to be a safe velocity for brome grass in vigorous condition on silt loam soil. If, because of low fertilility, vigorous growth is not maintained, or if the soil is sandy in texture, the channel should be designed for lower velocity. That means a wider and shallower cross-section. Therefore, the texture and fertility of the soil as well as the watershed acreage, slope and rainfall characteristics enter into the design of waterways.

Southern strains of brome grass (Lincoln in Nebraska or Achenbach in Kansas) mixed with alfalfa or red clover have been recommended for vegetating waterways in this area. Failures of some grassed waterways which were of adequate hydraulic design, indicate that other grasses should be seeded in a mixture with brome grass on certain soils.

On heavy soils, in sites that are inclined to be droughty due to shallow topsoil or because of western exposure to the summer sun, western wheat grass is better adapted than brome grass and therefore it is more persistent through extended periods of deficient rainfall.

Brome grass does not make a vigorous growth on the sandy or eroded, infertile glacial or residual soils. For this reason, it is subject to rilling in the waterway channels. Some of the adapted, native, sod-forming grasses such as switch grass or big bluestem, grow more vigorously and persistently than brome grass under such conditions. Therefore, a mixture of grass species usually is desirable. Wheatgrasses are adapted with brome to heavy soils and switch grass with brome to sandier sites. Observations indicate that intermemediate wheatgrass may be equal or superior to brome grass in both heavy and sandy soils.

After a site has been selected and the minimum size determined, the channel must be shaped to the calculated dimensions. Where the site has not been severely eroded and little, if any, dirt moving is required, simple plowing followed by discing, harrowing and perhaps dragging with a float or road drag will shape and compact the seedbed.

On the other extreme, where the site is badly gullied, extensive earth moving is required. This may entail the use of bulldozers, carryalls, blades or other heavy equipment. Between these two extremes are the small gullies 2 to 4 feet in depth and width that can be filled, packed and shaped with a farm tractor and plow.

Any soil placed in the gully should be firmly packed with the tractor wheels. This will prevent subsequent settling and cracking, and will lessen the likelihood of the soil being washed out before vegetation is established.

The discussion of minute details of the shape of the channels may be purely academic if the construction is done by the farmer with his own equipment and with little or no on-site assistance.

Very small flows or trickles of run-off are inclined to meander over flat-bottomed vegetated channels. This meandering may result in siltation, uneven flow and may eventually lead to erosion in the channel. On the other hand, flat-bottomed channels provide more uniform depth and velocity than parabolic or V sections under medium or heavy flow.

If heavy equipment is operated carefully, a flat-bottomed channel may be built. If, however, a truly flat-bottomed cross-section is not contructed, it is preferable to have a broad V or slightly dished, parabolic section. This is easier to achieve with ordinary farm equipment. Small flows will stay in the low center of such a channel and will not meander.

Assume, for the purpose of this discussion, that all earth moving has now been done in the construction of the designed channel. The seedbed must be prepared so as to:

1. Hold the seed while it sprouts and grows.
2. Absorb and then release water for the grass.

In background of this Nebraska feedlot picture can be noted an ideal waterway handling excess water from terraced field. Field at left in distance is terraced and planted to bromegrass.

3. Supply plant food.

A certain amount of loose soil on the seedbed is necessary to cover the seed. On the other hand, the soil underneath must be firm enough to enable the tiny grass seedlings to take root and survive. The seedbed requirement, as to tilth is, then, a firm soil with just enough loose dirt to cover the seed. This condition can be attained by the use of a disk harrow, spiketooth harrow, drag, roller, or cultipacker. Which tool should be used first is dependent on the condition of the soil but it is safe to say that the last tool should be a packer of some sort.

Grassed waterways are often located where water has naturally concentrated. Here, sheet or gully erosion has frequently removed the more fertile topsoil, leaving only the sterile, infertile subsoil. The infiltration rate of heavy soils is quite slow, especially if the soils lack organic matter. These heavy soils are slow to take up water, but hold it tenaciously when the plants need it.

On the other hand, loose sandy soils absorb and release water readily but have only a limited water-holding capacity. The addition of organic matter at or near the surface improves the water relationship of either light or heavy soils by improving their ability to take up or release water more readily, or it increases the waterholding capacity of sandy soils. So, the water-taking, waterholding, or water-releasing capacity of soils for grassed waterways will be improved by the addition of organic matter.

Waterways present the worst erosion hazard on the farm. A vigorous stand of grass is required at these points to prevent damage. Sometimes the stand of grass must be established in a short time between heavy run-offs. The rapidity with which the new stand can be established may determine the difference between success and failure.

Where alluvial deposits of soil have accumulated or where the waterway is located on deep fertile soil, additional fertility may not be needed. However, additional plant food in the form of barnyard manure, commercial fertilizer or leguminous preparatory crops is usually a good investment. Barnyard manure worked into the surface an inch or more during seedbed preparation is less apt to be swept out of the channel by the first runoff than if spread on top. However, the most important thing is to get manure on the waterway. Get fine manure and spread it evenly if possible, but get it on. Poultry manure and sheep manure are excellent, but whatever kind is to be had, get it on!

The use of phosphatic fertilizers is in its infancy in this area, and there are no extensive data to prove their value. In view of the urgency of getting a good stand quickly and of keeping it in vigorous condition, the use of 200 pounds of 10–20–0 is recommended, especially where the topsoil is thin and the supply of barnyard manure is limited.

The essential steps in seeding grass are:

1. To distribute an adequate amount of seed uniformly over the seeded area.
2. To cover the seed lightly.
3. To press the covering soil down firmly to insure prompt germination and the best possible survival of the seedlings.

Ordinarily, a drill followed by a packer is the best combination of tools to use. If a drill capable of performing these functions is not available, the seed may be broadcast by hand or by a machine. Covering may be accomplished by repeated packing with a toothed or corrugated roller.

It is commonly accepted practice to seed 10 to 15 pounds of brome grass with 3 to 4 pounds alfalfa per acre for establishing pastures in this area. This places from 45 to 70 brome seeds per square foot or far more than enough to make a stand if even half of them produce permanent plants. Because of the urgency of establishing a dense protective cover in waterway channels, twice the normal rate of seeding is recommended. Twenty to thirty pounds of brome grass seed may seem to be a waste of seed. It would be if the seedbed and all conditions were ideal. However, compared with the other expenses involved in vegetating waterways, or compared with the damage which may result if a stand is not obtained, the cost of the seed is inconsequential.

When a good stand is needed at once, it would be penny wise and pound foolish to skimp on seed. As with many important objectives, the waterway situation must be controlled immediately without penny pinching on this or other important factors.

After the seeding and packing operations are completed, the waterway should be mulched with 10 to 15 tons of strawy manure per acre to add to the fertility and to prevent blowing, washing, crusting, or drying out of the surface soil. If manure is not available, straw, hay stack butts, or corn cobs may be substituted.

Terrace outlet with good bromegrass, of a kind increasingly popular in Nebraska.

The optimum date of seeding depends on (1) the species of grass being seeded, (2) the soil moisture, (3) the hazard from erosion incurred by waiting for a better season, and (4) grasshopper damage hazard. The advantages of seeding brome grass and alfalfa, wheatgrass, and all of the tame grasses in the fall are (1) the seeded grasses will become established in the fall and will be better able to compete with weedy annual grasses than if seeded in the spring, (2) there is a better chance of the grass becoming well established before being subjected to heavy flows of water because heavy rains occur more frequently in the spring and summer than in the fall. The optimum date is September 1 to 15 unless grasshoppers indicate delayed seeding, but good stands are frequently obtained by seeding in October. Spring seedings should be made immediately following the optimum date for oats or should be delayed until June 1 to 10 to avoid the period of heaviest competition with weeds.

Warm season grasses can seldom be established by drilling seed in the fall. They should be seeded in the spring at the optimum date for planting corn.

The need for protection from run-off water until the grass is established sometimes justifies special precautions. Where the topography will permit temporary diversion dikes may be constructed to keep run-off water out of the channel for a season or two. There will be less damage by erosion in the channel of the temporary diversions if the dikes are constructed from below, leaving surface soil in the temporary water channel.

If the watershed is large or where water cannot be diverted, it is sometimes advisable to do the required channel shaping in June, after the period of the heaviest rainfall. Apply the lime, manure, or fertilizer that will be required for the permanent grass and, after the seedbed has been prepared, broadcast or close drill 30 pounds Sudan grass, 60 pounds of cane or 2 bushels of corn per acre. Mow frequently enough to prevent the formation of seed, leaving a 6- or 8-inch stubble. The forage may be removed for feed or may be left for mulch unless it is heavy enough to interfere with subsequent seeding operations.

Seed the grass legume mixture in the fall or the following spring in the undisturbed stubble.

In conclusion, the water-disposal system is the framework or skeleton of the entire soil conservation program in the area under discussion. Until it is established, or if it fails, none of the other practices can function properly.

Therefore, since it is such a vital part of the entire program it must be made to work and to continue to work. This ideal situation can be approached if not fully achieved, by giving diligent attention to each of the essential points in planning and establishing vegetated water-disposal systems:

1. Adequate design.
2. Careful construction.
3. Selection of adapted species of grasses.
4. Provision for fertility.
5. Timely seeding and packing.
6. Maintenance without abuse.

REVIEWS

BREAKING NEW GROUND. By Gifford Pinchot. 522 pages. Illustrated. Harcourt, Brace & Co., New York, N. Y. 1947. $5.

Breaking New Ground is "The story of how forestry in America was born and how American forestry in turn gave birth to the conservation policy. It is an outline also of how the conservation of natural resources, and of human resources as well, began to spread from America to all the world as the firm basis of prosperity among men and of lasting peace among nations."

It is disappointing to note that soil conservation was given consideration as early as 1898 but no soil erosion control measures were suggested. In fact, the author may not have sensed the importance of soil conservation, for he states that "A well handled farm gets more and more productive as the years pass. So does a well handled forest. On a badly handled farm, contrariwise, production decreases, the soil washes or blows away, floods are encouraged, and not only the farmer but also the public interest suffer loss. The same is true in general of a badly handled forest except that damage to the public interest is wider and worse." Probably the author did get a faint glimpse of the importance of soil conservation when he stated "It is true, indeed, that the forest rightly handled—given the chance—is next to the earth itself the most useful servant of man." If the word earth as used here is interpreted to mean top soil, then many people will agree that G. P. was on the right track. The proceedings, findings, and recommendations of the Inland Waterways Commission, following the famous trip down the Mississippi River with Teddy Roosevelt in 1907, "pointed out that the annual loss of fertile soil from erosion was about 1 billion tons; that 3 times the 10 million acres then irrigated were irrigable; and that swamp and overflow land enough to support 10 million people could be reclaimed. Further, * * * in those days the Mississippi alone carried yearly to the sea a cubic mile of the richest portions of our richest farms. By now one-third of our top soil, the soil that feeds us all, has been lost for good."

The author determined as early as 1900 that "Overgrazing loosens the soil so that heavy rains sweep it from the hillsides where it belongs and into the streams where it does not belong and so to the sea, silting up reservoirs on the way." He declared, "Overgrazing was largely responsible for the terrible dust storms which so crucified the semiarid waste in the spring of 1935 * * * These dust storms cost the government and the farmers hundreds of millions of dollars and supplied one more demonstration of what individual greed can do to a great public resource under the gentle impulse of its own sweet will." The statement that the 1935 dust storms were largely due to overgrazing is open to question.

Historians may disagree on the importance the author attached to some of his experiences and the parts they played in the conservation movement of the world. No one will deny that G. P. was an outstanding public leader and a powerful influence for good, not only in forestry but in conservation as a whole.

—JOHN KELLER.

FARM PONDS IN ARIZONA.—Interest in farm ponds continues to grow in the Navajo County Soil Conservation District in Arizona, according to L. K. Armstrong, Soil Conservation Service technician working with the district. Armstrong reports that two new ponds were completed recently with Soil Conservation Service technicians doing the planning and staking, while contractors did the earth moving.

The moving of almost 2,000 cubic yards of earth was involved in the building of L. M. Merkely's pond at Pinedale. This pond will provide stock water, and water also will be piped to the house and for irrigation of a small garden. A 2,500-foot diversion ditch collects water for the pond. Otherwise, Merkely's farm is nonirrigated and already is being terraced and contour cultivated.

V. B. Peterson at Lakeside also has constructed a farm pond which will serve as a combination overnight irrigation water-storage reservoir and fish pond. A little more than 1,100 cubic yards of earth in the dam will make it possible to store 4½-acre feet of water to a depth of about 10 feet. After irrigation water is drawn off, the water still will be four feet deep, giving plenty of space for fish, Armstrong says.

Peterson already has seeded 4 acres of irrigated pasture on land leveled with the district-owned automatic leveler as part of his complete soil and water conservation plan. This land is being irrigated with contour spreader furrows, 1,450 feet of them, accurately laid out with district assistance.

WIDELY ADOPTED.—Soil conservation districts all over the country are beginning to discover SOIL CONSERVATION Magazine. In ever-increasing numbers they are entering subscriptions on behalf of schools, libraries, farmer-cooperators, and others, as a means of developing an understanding of the principles and practices of the soil conservation program. Banks and civic clubs are also purchasing the periodical in large quantities for farm clients and rural leaders. All orders, $1 per year in advance, go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

SOIL AND CHURCH

(Continued from page 180)

Of course, the Church must be much more than a soil conservation agency. As a matter of fact, it may render its greatest service, not just dealing with this important subject, but rather, to help rural people catch a vision of what the Christian gospel really is, and how it relates to all of life. It needs to stir the hearts of people to help them help themselves. By the exercise of its traditional functions, carried out with a new content and a new application to rural life and its needs and opportunities, the Church can provide the needed dynamic force that will spell the difference between success and failure in the rebuilding of rural America.

GAINS POSTED IN SOUTHEASTERN STATES

A DIFFERENT STORY TODAY.—"Several years ago I stopped selling milk because I couldn't make it pay. Today it's a different story," reports Lawrence P. Johnson, of Scottsboro, Ala., a cooperator in the Northeast Alabama Soil Conservation District. "This is a direct result of assistance furnished by the Soil Conservation Service technicians in over-all farm planning based on land capabilities. Now I can see my way clear with 45 acres of winter grazing, 12 acres of sericea pasture, 8 acres of Kentucky fescue, and 15 acres of permanent pasture. I will continue to develop my grazing program as outlined by the Soil Conservation Service, because it has proved to be profitable and at the same time is controlling erosion on my farm."

FARM VALUE UP $10,000.—"Three years ago when you began working in this district, if you had attempted to get me to do all the things I'm doing on my farm, I probably would have ignored the program altogether," said Ed L. Watkins, of Inverness, Fla., a cooperator in the Gulf Soil Conservation District. "As a result of the way it has been handled, all of my farms are now under definite long-time soil conservation plans that fit into my farming program. I believe that on one of these farms alone, the farm value has increased by $10,000 as a result of what has been done, and I have only gotten started on the program."

IT HAPPENED IN 8 YEARS.—"In 1939 I contacted a newly married farmer regarding a conservation plan on his farm in the Madison County District in Tennessee," reports J. R. Sasser, district conservationist at Jackson, Tenn. "The farm was badly eroded and there were no buildings, other than a log cabin which was used as a home by the farmer and his new wife. The farm was planned, terraces were laid out, rotations were started, waterways were prepared, fences were planned, and a complete soil conservation program was started.

"Soon after planning the farm, I was transferred elsewhere, and subsequently entered military service. After returning to SCS duty I was stationed at Jackson, Tenn., and decided to drive out to the Guy W. Longmire farm and see what progress had been made. The sight was a revelation. Instead of a log cabin, I saw a well-constructed farm house, barn, tool shed, etc. The waterways were neatly clipped, strip crops established, terraces were well maintained, and there was every evidence of a successful farmer.

"When asked about how the program worked out, Mr. Longmire said, 'This way of farming has really paid off for me. I completed the second cycle of my rotation this year and where I used to grow less than 200 pounds of lint cotton an acre I now grow over 500 pounds an acre.'

"To plan a farm and then see 8 years later the plan written on the ground in good conservation practices, with success written all over the farm and the farmer, is an experience well worth remembering."

LIFETIME PROPOSITION.—"When I signed a soil conservation plan with the Robert E. Lee Soil Conservation District, it played hob with the way I used to work," T. H. Tanner, of Appomattox County, Va., wrote B. G. Anderson, district chairman. "Where I used to have to cultivate almost all of the open land on the place to barely make a living, now with normal seasons I can have a surplus of legume seed, corn, wheat, and dairy, pork, and poultry products for sale. Where I used to have to skin every straw, corn fodder, and hay to feed a pair of horses and a few cows, now I can store enough good hay, and leave the residue of wheat straw and corn stalks on the land. Seventeen years ago on a 5½-acre field, I gathered about 10 barrels of corn nubbins. This year I gathered 10 barrels of good corn *to the acre* on 2½ acres of the same field, which I worked in contour strips. In the other strips, I harvested good hay, 25 bushels of wheat to the acre, and red clover and lespedeza seed. So please tell new prospects it's not what they do in any one year or two, but it's a lifetime proposition."

BETTER LIVING.—"If my Daddy were living, he wouldn't believe what we are doing," said Lester Guin, of the New Hope Community, a cooperator in the Lowndes County Soil Conservation District in Mississippi. "We boys were raised up thinking that the only way to make a living was by growing cotton and corn and that heavy fertilization would burn up a crop. Now after 5 years of following the district conservation plan, I'm not growing a stalk of cotton, have only half my original cultivated acreage in row crops, and I am making the best living I've ever made and easier, too. With the 100-bushel corn-production plan which looked so good in Lowndes County the past season, I can see how I can cut my plowed land in half again."

MORE MILK WITH KUDZU.—"I was milking 44 cows this past spring when dry weather reduced the grazing on my Bermuda grass and lespedeza pasture to where I was getting only 95 gallons of milk a day from my herd," reports Lonnell Prather, of Harlem, Ga., a cooperator in the Little River Soil Conservation District.

"I was very anxious to get my milk production up, so I let my cows graze on my 7-acre field of kudzu about 3 hours a day. I reduced my concentrate feeds about one-third and the second day after my cows started on the kudzu I was milking 105 to 110 gallons a day."

TECHNICAL WORK WORTH $20,000.—"You SCS folks have been worth $20,000 to my farm in the last 7 years," declared C. C. Holland, of Statesville, N. C., a cooperator in the Middle Yadkin Soil Conservation District. "For 5 years, my 400-acre farm didn't make enough to pay the taxes. The tenants patched around between gullies with cotton, and wheat ran about 8 bushels an acre. The SCS folks showed me how to handle my land. I did everything to the farm that they told me it needed, and last year, after 7 years, my wheat averaged 39 bushels an acre instead of 8. I'm proud as I can be of my farm now. It's a sight. There are 275 acres of fine alfalfa on the farm now, all put in where gullies used to be. My two boys are back from overseas and they are surprised and pleased. They plan to take over the farm."

EVERY TEACHER SHOULD KNOW.—"I have been looking at these hills all my life, but not until today have I seen them," commented Miss Emma Branch Cunningham, teacher in the Belton, S. C., city schools, during a soil-conservation tour. "Every teacher in South Carolina should have an opportunity to see what has happened to our soil and what can be done to conserve and improve it."

PREREQUISITE TO PROGRESS.—"This farm plan is what I have wanted," declared H. J. Bilharz, of Louisville, Ky., who owns and operates a 600-acre farm in Oldham County Soil Conservation District. "I now have a definite, clear plan to follow, and I value this plan at $1,500."

NEWS FLASHES FROM FARMS OF SOUTHWEST

INCREASED FORAGE.—In 1942 Walter Sneddon began improving his farm's irrigation system, leveling fields, installing concrete drops, checks and turnouts in ditches, and working out a crop rotation which included a soil-building crop of irrigated pasture. Sneddon's farm is north of Salida, Colo., in the Upper Arkansas Soil Conservation District.

Ten years ago, a 26-acre alfalfa field on this farm brought a gross income of $25 per acre. By 1943 the alfalfa was thinning out and Sneddon planted a grass seed mixture recommended by the Soil Conservation Service.

In 1947, this same field brought a net return of $117.23 per acre. Sneddon attributes this to the greater forage production and to the "cafeteria style" feeding. In addition to the increased income, the sandy, erodible fields were not damaged by wind or water erosion, a minimum of irrigation water was used, and harvesting and hay-labor problems were nonexistent. "I'm seriously considering putting in all my irrigated land to pasture grass and buying alfalfa and grain needed for supplemental and winter feed from my neighbors," Sneddon said recently.

SAGEBRUSH AND SLOPES.—Restoring 20 acres of burned-over sagebrush land to a profitable grazing area and at the same time checking severe erosion on the tract through use of soil- and water conservation practices has been the experience of Lorin S. Roundy of Alton, Utah.

This sagebrush area, on a steep hill slope averaging 15 percent was swept by a range fire in 1944. During the following year the denuded 20 acres became subject to severe sheet and gully erosion, so Roundy realized that he must do something if he were to save the productive soil.

He then made application to the Kane County Soil Conservation District for technical assistance in solving his problem. Boyd A. Murray, Soil Conservation Service representative working with the district, accompanied Roundy over the area. Together, they worked out a complete soil- and water-conservation program.

This plan, completed in October 1945, called for brush check dams in all active gullies, and the reseeding of the entire area to prevent further run-off and loss of soil.

Roundy built the brush dams in the worst gullies immediately, and then prepared to plant the area to a mixture of crested and Western wheatgrasses. However, he soon realized that the seeding of range land on a 15-percent slope would be a difficult problem. The area was covered with hoarhound, a perennial weed, and sunflowers. Realizing the danger of plowing such land to kill weeds, Roundy broadcast the grass mixture, and then covered it by using a cultivator on the contour. He figured that the contours would hold enough moisture to establish the grass regardless of the heavy weed infestation.

The area was planted on November 20, 1945, and although precipitation for 1945 and 1946 was below normal, the seed germinated early in April 1946. Most of the crested wheat headed out last year, and now an excellent stand of grass covers the 20 acres.

Although the area was ready for grazing just a year after being seeded, Roundy has not overlooked the need for protecting against overgrazing, and leaves an average stubble height of three inches over the old sagebrush land.

CROP STUBBLE CONSERVES MOISTURE.—Despite the drouth this year, Frank Konopasek, a cooperator with the Roosevelt Soil Conservation District who farms three miles east of Portales, N. Mex., reports that he was able to produce good crops as a result of following soil and water conservation practices.

"My Spanish peanuts made 19 bushels to the acre, and my hegari yielded 200 bundles with well-filled heads of grain," Konopasek said. "I consider my crops no better than might have been produced on any deep sandy soil similar to mine if proper practices are used.

"A lot depends on the way the land is handled," he continued. "With our limited rainfall we can't afford to let weeds take any of the moisture. Furthermore, we can prevent a lot of moisture loss by timely tillage and proper use of crop stubble. Crop rotation is another practice which I follow regularly. I never plant the same crops on the same land in successive years. When crops are harvested I leave plenty of stubble and stalks to check soil blowing."

PUBLIC LIBRARY
FEB 24 1948
DETROIT

GRASS MAGIC.—Ralph Wann, owner of a large ranch in the Turkey Creek Soil Conservation District, in Pueblo and Fremont Counties of Colorado, knows the results of soil and water conservation on range land.

In 1944, when he took over this ranch, it had been heavily grazed and had only one watering place for 54,000 acres of pasture. It had then an estimated carrying capacity of 200 head of cattle.

Wann started out by "resting" the land for one year and installing developments to provide adequate livestock water. He then began to stock conservatively, according to the forage produced. He continued this conservative stocking, increasing his livestock numbers only as fast as the range recovered. He fed phosphate salt to supplement mineral-deficient grasses, and has changed things so that observers say it "isn't the same ranch." His grass has vigor and puts on good growth. In 1947 he had grama grass seed stalks 30 inches tall. And in 1947 he had forage for 1,000 head of cattle, as contrasted with 200 6 years before.

U. S. GOVERNMENT PRINTING OFFICE: 1948